Geometric Effects in RLAs

- Three geometries
  - Racetrack
    - Two linacs
    - All arcs same length as longest arc
  - Dogbone
    - Single linac
    - Turn around at each end: 420°
    - Length proportional to energy
  - Racetrack taking shortcuts
    - Turn hard
    - Go straight to get between linacs
- Optimize each design for 3–20 RLA

	Racetrack	Shortcut	Dogbone
Passes	8	9	10
Linac (GeV)	2.268	2.026	1.782
Phase (°)	20	21	17
η/B	0.0474	0.0511	0.0151
ΔE (MeV)	180	174	207
Cost (Nrb)	185	166	146

Conclusions

- Dogbone
  - Advantages
    - Lower cost
    - Easier switchyard
    - Lower momentum compaction
  - Disadvantages
    - Parking garage (largest radius: 60 m for 1 T)
    - Slightly larger energy spread
    - More loading
      - More passes
      - Smaller phase
- Shortcut
  - Lower cost, not as much as dogbone
  - Disadvantages
    - Parking garage
    - Worse switchyard
    - Higher momentum compaction